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(54) Title: CLEANING COMPOSITIONS CONTAINING BIOSTATIC AGENT

(57) Abstract

The present invention relates to an aqueous cleaning composition containing at least one biostatic agent, at least one surfactant and water.

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CLEANING COMPOSITIONS CONTAINING BIOSTATIC AGENT

Field of the Invention

The present invention relates to an aqueous, cleaning composition which is

- 5 useful for the control of bacteria, fungus, molds, spores, viruses and germs as well as for the removal of grease, soap scum or tar without any mechanical action. In particular, the instant compositions comprise a surfactant system and at least one biostatic agent.

Background of the Invention

- 10 Bleaching cleaning, oxidizing and disinfectant compositions have been used in home and industrial applications for hard surface care and fabric care.

- Hypochlorite bleaches are very effective at removal of stains, when they are used in relatively high concentrations, but these hypochlorite, as well as other active chlorine bleaches, can cause rather severe damage to fabric colors as well as
- 15 damaging textile fibers. Additionally, these hypochlorite liquid bleaches can present handling and packaging problems. Color and fabric damage can be minimized by the use of milder oxygen bleaches such as potassium monopersulfate; however, stain removal characteristics of these peroxygen bleaches are much less desirable than those of the harsher halogen bleaching agents. Commercial bleaching compositions
- 20 which contain peroxygen bleaches commonly utilize activators; which are compounds that enhance the performance of the peroxygen bleachant. Bleaching compositions which have employed various types of bleach activators have been disclosed in: Popkin, U.S. Patent 1,940,768, Dec. 26, 1933; Baevsky, U.S. Patent 3,061,550, October 30, 1962; Mackellar et al, U.S. Patent 3,338,839, August 29, 1967; and
- 25 Woods, U.S. Patent 3,556,711, January 19, 1971.

Hydrogen peroxide and surfactant mixtures have been disclosed in European Patent Application and Patent Nos: EP 0376,704B1; EP 0376706A1 and EP 0009839B2.

Many cleaners combining a disinfecting or biostatic action with a cleaning function have already been commercialized and are present on the market place in various product categories, mainly household and personal care. These products are based on various chemistries or action modes and are designed to deliver an

5 instantaneous disinfecting or sanitizing action at the point of use. The instant invention teaches that it is possible to deliver, by means of incorporating suitable ingredients in appropriate cleaning compositions, a preventive action delaying the growth of stains (bacteria and/or molds) on the treated surfaces, thereby retarding associated nuisances such as contamination, malodor and staining.

10 The present invention brings a new and different technical benefit: it has been found that it is possible to deliver, independently of an optional disinfection taking place at the point of use, a preventive action able to considerably retard further strain growth on the treated porous surface. This can be achieved by incorporating in a composition a well selected "biostatic" molecule which acts as a "surface preservative" and delays
15 new germs development; this composition can optionally incorporate a bleaching agent. Ideal compositions are those presenting excellent wetting properties to allow a deep penetration of the composition in pores and fractures, and thus an improved in depth active delivery.

These compositions are able to deliver both a cleaning action and a remanant
20 prevention against further strain growth. Derived products contain user friendly ingredients compared to the currently used aggressive chlorine based compositions. Such products which confer to the cleaning action a sanitizing secondary benefit would also permit a less frequent cleaning whilst maintaining the surfaces longer clean and hygienic.

25 Such products should especially be useful in bathroom where it is very difficult to get rid of colored molds such as *Aspergillus niger*, *Rhodotorula minuta* and various *Penicilium* species.

The present invention relates to a biostatic agent containing cleaning composition, suitable at room temperature or colder or at a higher temperature for pre-treating and cleaning materials soiled with a lipophilic soil. The composition comprises a biostatic agent together with at least one surfactant and water. The invention also

5 relates to the killing as well as the prevention of the formation of fungus, molds, spores, viruses, germs and bacteria as well as to a processes for treating items and materials soiled with soils such as lipophilic soil, with compositions of this invention.

Summary of the Invention

The instant invention relates to a cleaning composition comprising at least one
10 surfactant, a biostatic agent and water.

Accordingly, it is an object of the instant invention to provide an aqueous cleaning composition which is useful in a cleaning operation for the control and prevention of the formation of bacteria, fungus, molds and germs as well as for removal of grease and soap scum.

15 Detailed Description of the Invention

The present invention relates to an aqueous cleaning composition which comprises by weight:

- a) 0.5 to 10%, more preferably 1.5 to 8% of at least one surfactant selected from the group consisting of anionic surfactants and nonionic surfactants and mixtures
20 thereof;
- b) 0.2 to 10 wt. %, more preferably 0.4 to 8 wt. % of a biostatic agent; and
- (c) the balance being water, wherein the composition does not contain any chlorine containing bleach, a peroxygen bleach, hydrogen peroxide or builder, wherein the cleaning composition does not contain any water soluble or water dispersable
25 organic binding agent, sequestering agent, acid dye, pigment, an organic solvent selected from straight chain, primary, secondary and tertiary C₄-C₁₀ alkanols, C₅-C₁₀ alicyclic alkanols, C₂-C₄ dialkyl ethers, C₃-C₂₀ glycol ethers and mixtures thereof, C₈-

C₁₈ fatty acid monoester of diglycerol, C₈-C₁₈ fatty acid monoester of diglycerol and C₈-C₁₈ fatty acid diester of tetraglycerol.

The water soluble ethoxylated nonionic surfactants which can be utilized in this invention are commercially well known and include the primary aliphatic alcohol

5 ethoxylates, secondary aliphatic alcohol ethoxylates, alkylphenol ethoxylates and ethylene-oxide-propylene oxide condensates on primary alkanols, such as Plurafacs (BASF) and condensates of ethylene oxide with sorbitan fatty acid esters such as the
Tweens (ICI). The nonionic synthetic organic detergents generally are the
condensation products of an organic aliphatic or alkyl aromatic hydrophobic compound
10 and hydrophilic ethylene oxide groups. Practically any hydrophobic compound having a carboxy, hydroxy, amido, or amino group with a free hydrogen attached to the nitrogen can be condensed with ethylene oxide or with the polyhydration product thereof, polyethylene glycol, to form a water-soluble-nonionic detergent. Further, the
length of the polyethenoxy chain can be adjusted to achieve the desired balance
15 between the hydrophobic and hydrophilic elements.

The nonionic detergent class includes the condensation products of a higher alcohol (e.g., an alkanol containing 8 to 18 carbon atoms in a straight or branched chain configuration) condensed with 5 to 30 moles of ethylene oxide, for example, lauryl or myristyl alcohol condensed with 16 moles of ethylene oxide (EO), tridecanol
20 condensed with 6 to moles of EO, myristyl alcohol condensed with 10 moles of EO per mole of myristyl alcohol, the condensation product of EO with a cut of coconut fatty alcohol containing a mixture of fatty alcohols with alkyl chains varying from 10 to 14 carbon atoms in length and wherein the condensate contains either 6 moles of EO per mole of total alcohol or 9 moles of EO per mole of alcohol and tallow alcohol
25 ethoxylates containing 6 EO to 11 EO per mole of alcohol.

A preferred group of the foregoing nonionic surfactants are the Neodol ethoxylates (Shell Co.), which are higher aliphatic, primary alcohol containing 9-15 carbon atoms, such as C₉-C₁₁ alkanol condensed with 8 moles of ethylene oxide

(Neodol 91-8), C₁₂₋₁₃ alkanol condensed with 6.5 moles ethylene oxide (Neodol 23-6.5), C₁₂₋₁₅ alkanol condensed with 12 moles ethylene oxide (Neodol 25-12), C₁₄₋₁₅ alkanol condensed with 13 moles ethylene oxide (Neodol 45-13), and the like. Such ethoxamers have an HLB (hydrophobic lipophilic balance) value of 8-15 and give good

- 5 O/W emulsification, whereas ethoxamers with HLB values below 8 contain less than 5 ethyleneoxide groups and tend to be poor emulsifiers and poor detergents.

Additional satisfactory water soluble alcohol ethylene oxide condensates are the condensation products of a secondary aliphatic alcohol containing 8 to 18 carbon atoms in a straight or branched chain configuration condensed with 5 to 30 moles of
10 ethylene oxide. Examples of commercially available nonionic detergents of the foregoing type are C₁₁-C₁₅ secondary alkanol condensed with either 9 EO (Tergitol 15-S-9) or 12 EO (Tergitol 15-S-12) marketed by Union Carbide.

Other suitable nonionic detergents include the polyethylene oxide condensates of one mole of alkyl phenol containing from 8 to 18 carbon atoms in a straight- or
15 branched chain alkyl group with 5 to 30 moles of ethylene oxide. Specific examples of alkyl phenol ethoxylates include nonyl phenol condensed with 9.5 moles of EO per mole of nonyl phenol, dinonyl phenol condensed with 12 moles of EO per mole of dinonyl phenol, dinonyl phenol condensed with 15 moles of EO per mole of phenol and di-isooctylphenol condensed with 15 moles of EO per mole of phenol. Commercially
20 available nonionic surfactants of this type include Igepal CO-630 (nonyl phenol ethoxylate) marketed by GAF Corporation.

Condensates of 2 to 30 moles of ethylene oxide with sorbitan mono- and tri-C₁₀-C₂₀ alkanolic acid esters having a HLB of 8 to 15 also may be employed as the nonionic detergent ingredient in the described shampoo. These surfactants are well
25 known and are available from Imperial Chemical Industries under the Tween trade name. Suitable surfactants include polyoxyethylene (4) sorbitan monolaurate, polyoxyethylene (4) sorbitan monostearate, polyoxyethylene (20) sorbitan trioleate and polyoxyethylene (20) sorbitan tristearate.

Suitable water-soluble non-soap, anionic surfactants used in the instant compositions include those surface-active or detergent compounds which contain an organic hydrophobic group containing generally 8 to 26 carbon atoms and preferably 10 to 18 carbon atoms in their molecular structure and at least one water-solubilizing

- 5 group selected from the group of sulfonate, sulfate and carboxylate so as to form a water-soluble detergent. Usually, the hydrophobic group will include or comprise a C₈-C₂₂ alkyl, alkyl or acyl group. Such surfactants are employed in the form of water-soluble salts and the salt-forming cation usually is selected from the group consisting of sodium, potassium, ammonium, magnesium and mono-, di- or tri-C₂-C₃
- 10 alkanolammonium, with the sodium, magnesium and ammonium cations again being preferred.

- Examples of suitable sulfonated anionic surfactants are the well known higher alkyl mononuclear-aromatic sulfonates such as the higher alkyl benzene sulfonates containing from 10 to 16 carbon atoms in the higher alkyl group in a straight or
- 15 branched chain, C₈-C₁₅ alkyl toluene sulfonates and C₈-C₁₅ alkyl phenol sulfonates.

- A preferred sulfonate is linear alkyl benzene sulfonate having a high content of 3- (or higher) phenyl isomers and a correspondingly low content (well below 50%) of 2- (or lower) phenyl isomers, that is, wherein the benzene ring is preferably attached in large part at the 3 or higher (for example, 4, 5, 6 or 7) position of the alkyl group and
- 20 the content of the isomers in which the benzene ring is attached in the 2 or 1 position is correspondingly low. Particularly preferred materials are set forth in U.S. Patent 3,320,174.

- Other suitable anionic surfactants are the olefin sulfonates, including long-chain alkene sulfonates, long-chain hydroxyalkane sulfonates or mixtures of alkene
- 25 sulfonates and hydroxyalkane sulfonates. These olefin sulfonate detergents may be prepared in a known manner by the reaction of sulfur trioxide (SO₃) with long-chain olefins containing 8 to 25, preferably 12 to 21 carbon atoms and having the formula RCH=CHR₁ where R is a higher alkyl group of 6 to 23 carbons and R₁ is an alkyl

group of 1 to 17 carbons or hydrogen to form a mixture of sultones and alkene sulfonic acids which is then treated to convert the sultones to sulfonates. Preferred olefin sulfonates contain from 14 to 16 carbon atoms in the R alkyl group and are obtained by sulfonating an α -olefin.

5 Other examples of suitable anionic sulfonate surfactants are the paraffin sulfonates containing 10 to 20, preferably 13 to 17, carbon atoms. Primary paraffin sulfonates are made by reacting long-chain alpha olefins and bisulfites and paraffin sulfonates having the sulfonate group distributed along the paraffin chain are shown in U.S. Patents Nos.. 2,503,280; 2,507,088; 3,260,744; 3,372,188; and German Patent
10 735,096.

Examples of satisfactory anionic sulfate surfactants are the C₈-C₁₈ alkyl sulfate salts and the C₈-C₁₈ alkyl sulfate salts and the C₈-C₁₈ alkyl ether polyethenoxy sulfate salts having the formula $R(OC_2H_4)_n OSO_3M$ wherein n is 1 to 12, preferably 1
to 5, and M is a metal cation selected from the group consisting of sodium, potassium,
15 ammonium, magnesium and mono-, di- and triethanol ammonium ions. The alkyl sulfates may be obtained by sulfating the alcohols obtained by reducing glycerides of coconut oil or tallow or mixtures thereof and neutralizing the resultant product.

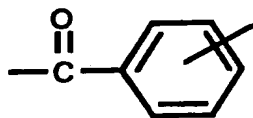
On the other hand, the alkyl ether polyethenoxy sulfates are obtained by sulfating the condensation product of ethylene oxide with a C₈-C₁₈ alkanol and
20 neutralizing the resultant product. The alkyl sulfates may be obtained by sulfating the alcohols obtained by reducing glycerides of coconut oil or tallow or mixtures thereof and neutralizing the resultant product. On the other hand, the alkyl ether polyethenoxy sulfates are obtained by sulfating the condensation product of ethylene oxide with a C₈-C₁₈ alkanol and neutralizing the resultant product. The alkyl ether polyethenoxy
25 sulfates differ from one another in the number of moles of ethylene oxide reacted with one mole of alkanol. Preferred alkyl sulfates and preferred alkyl ether polyethenoxy sulfates contain 10 to 16 carbon atoms in the alkyl group.

The C₈-C₁₂ alkylphenyl ether polyethenoxy sulfates containing from 2 to 6 moles of ethylene oxide in the molecule also are suitable for use in the inventive compositions. These surfactants can be prepared by reacting an alkyl phenol with 2 to 6 moles of ethylene oxide and sulfating and neutralizing the resultant ethoxylated

5 alkylphenol.

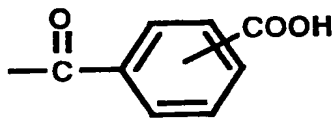
Other suitable anionic surfactants are the C₉-C₁₅ alkyl ether polyethenoxy carboxylates having the structural formula $R(OC_2H_4)_nOX$ COOH wherein n is a number from 4 to 12, preferably 5 to 10 and X is selected from the group consisting of CH₂, (C(O)R₁ and

10



wherein R₁ is a C₁-C₃ alkylene group. Preferred compounds include C₉-C₁₁ alkyl ether polyethenoxy (7-9) C(O) CH₂CH₂COOH, C₁₃-C₁₅ alkyl ether polyethenoxy (7-9)

15



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and C₁₀-C₁₂ alkyl ether polyethenoxy (5-7) CH₂COOH. These compounds may be prepared by considering ethylene oxide with appropriate alkanol and reacting this reaction product with chloracetic acid to make the ether carboxylic acids as shown in US Pat. No. 3,741,911 or with succinic anhydride or phthalic anhydride. Obviously, these anionic surfactants will be present either in acid form or salt form depending upon the pH of the final composition, with salt forming cation being the same as for the other anionic surfactants.

25

The biostatic agents used in the instant composition at a concentration of 0.2 to 10 wt. %, more preferably 0.4 to 8 wt. % are selected from the group consisting essentially of a C₈-C₁₆ alkyl dimethyl benzyl ammonium halide such as dodecyl dimethyl benzyl ammonium chloride (Benzalkonium chloride), a C₁₂-C₂₀ alkyl trimethyl ammonium halide such as cetyl trimethyl ammonium chloride (Cetrimonium chloride),

polyhexamethylene biguanide hydrochloride (Tradename-Cosmocil CQ), 3-trialkoxysilyl, C₁₄-C₂₀ alkyl dimethyl ammonium C₂-C₄ alkyl halide such as 3-tri-methoxysilyl, propyl octadecyl dimethyl ammonium chloride, (Tradename DC5700 - Dow Corning), cis-1-acetyl-4-[4[[2-(2,4-dichlorophenyl)-2-(1H-imidazol-1-ylmethyl)-1,3 dioxalan-4-

- 5 yl]methoxy]phenyl] piperazine (tradename - Ketoconazole), 1-(4-chlorophenoxy)-1-(1H-Imidazolyl)-3,3 dimethyl-2-butanone (tradename - Climbazole) and zinc-bis(2-pyridine-thiol 1-oxide) (tradename Zn Pyrithione) and mixtures thereof.

The following examples illustrate but do not limit the invention. Unless otherwise indicated, all parts in these examples, in the specification and in the appended claims

- 10 are by weight percent and all temperatures are in °C.

The formulas A through N were prepared by simple mixing at 25°C.

Example 1

	A	B	C	D	E	F	G	H
Sodium lauryl sulfate						2		
Neodol 91-5							2	
Biguanide								0.5
DC5700		0.5	0.75	1	2	0.5	0.5	
Climbazole								
Ketoconazole								
H ₂ O	100	99.5	99.25	99	98	97.5	97.5	99.5
Days to slight trace of mold	1	1	1	1	4	48	51	7
Days to heavy trace of mold	4	4	4	4	7	>100	>100	14

	I	J	K	L	M	N
Sodium lauryl sulfate						
Neodol 91-5				2	2	2
Biguanide	0.75	1.0	2	0.5		
DC5700						
Cimbazole						0.5
Ketoconazole					0.5	
H ₂ O	99.25	99.0	98.0	97.5	97.5	97.5
Days to slight trace of mold	4	7	5	>100	81	28
Days to heavy trace of mold	8	14	28	>100	>100	>100

A test has been designed to specifically evidence a germ growth preventive action has been devised. This lab test intends to be as close as possible of realistic conditions.

5 Test Material Selection:

In real world conditions, domestic strains, more especially molds, develop mainly in confined humid areas and appear on tiles grouting, concrete or plaster walls, wall paper as well as in silicone sealings interstices, shower curtain folds, etc.; these areas in which a permanent humidity can stay are prone to promote bacteria and molds apparition. Porous substrates such as the back side of wall tiles have been selected as lab culture medium.

In real world conditions, a minimum nutrient material (carbohydrate food, stuffing electrolytes...) is also needed to sustain the germs culture; it can be initially present (paper, glue...) or can result from the build-up of external contaminants (soapy water, air condensates, food or beverage stains...). It has been found that boiled orange juice is a very effective nutritive solution for lab purpose. Nutrient solution used in the following experiments is made from orange juice extract; this extract is prepared by boiling 1l orange juice for 1/2 hour and bringing back its volume to 1l by addition of DI water.

As inoculating material, the mold spores present on a naturally contaminated shower curtain have been collected. They were previously identified as being mainly *Aspergillus niger*, *Rhodotorula minuta*, *Candida albicans* and various *Penicilium* strains.

Procedure:

1. Bathroom ceramic tiles are immersed in a 5% hydrogen peroxide solution to eliminate potential undesirable germs. They are left overnight backside up to allow drying.

- 5 2. The back side of these tiles are treated with 20 g of prototype sample (2 replicates per prototype).
3. Tiles are then allowed to dry overnight (backside up).
4. Nutrient and inoculating solutions are then applied together (mixture of 50 ml germ containing solution per liter nutrient solution) on the porous side of the tiles
- 10 (±20 g mixture per tile).

5. After penetration of nutrient solution, the replicates tiles pairs are stacked two by two, backside on backside and deposited on a plastic film lying on a flat area. To avoid cross-contamination, stacks are separated one from each other by 1 cm.

- 15 Another plastic film is placed on the test samples to prevent them from important moisture loss and to protect ambient atmosphere against contamination.

6. Each day, the state of the tiles is monitored (signs of color or odor changes, of mold apparition or proliferation are noted). If needed, some water is sprayed on all tiles to maintain an adequate humidity level.

- 20 7. Tiles which are significantly contaminated by molds and/or bacteria are removed and treated with a hypochlorite solution.

The invention has been described with respect to various embodiments and illustrations of it but is not to be considered as limited to these because it is evident that one of skill in the art with the present specification before him/her will be able to utilize substitutes and equivalents without departing from the invention.

WHAT IS CLAIMED IS

1. A liquid cleaning composition comprising by weight:
 - (a) 1% to 10% of at least one surfactant;
 - (b) 0.2% to 10% of a biostatic agent; and
- 5 (c) the balance being water.
2. The composition according to Claim 1, wherein the surfactant is selected from the group consisting of anionic surfactants and nonionic surfactants and mixtures thereof.
3. The composition according to Claim 2, wherein said biostatic agent is a
- 10 C₈-C₁₆ alkyl dimethyl benzyl ammonium halide.
4. The composition according to Claim 2, wherein said biostatic agent is a C₁₂-C₂₀ alkyl trimethyl ammonium halide.
5. The composition according to Claim 2, wherein said biostatic agent is a
- polyhexamethylene biquanide hydrochloride.
- 15 6. The composition according to Claim 2, wherein said biostatic agent is a 3-trialkoxysilyl, C₁₄-C₂₀ alkyl dimethyl ammonium C₂-C₄ alkyl halide.
7. The composition according to Claim 2, wherein said biostatic agent is propyl octadecyl dimethyl ammonium chloride.
8. The composition according to Claim 2, wherein said biostatic agent is cis-
- 20 1-acetyl-4[4[2-(2,4-dichlorophenyl)-2-(1H-imidazol-1-ylmethyl)-1,3 dioxalan-4-yl[methoxyphenyl] piperazine.
9. The composition according to Claim 2, wherein said biostatic agent is 1, -(4-chlorophenoxy)-1-(1H-imidazolyl)-3,3-dimethyl-2-butanone.
10. The composition according to Claim 2, wherein said biostatic agent is
- 25 zinc-bis(2-pyridine-thiol-1-oxide).

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 98/08571

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 C11D3/48

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 C11D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 92 14810 A (JOHNSON & SON INC S C) 3 September 1992 see page 15, line 21 - page 16, line 36; claims 1-6; examples 1-3, 47-86 see abstract	1-6
X	FR 2 710 919 A (EPARCO FINANCIERE) 14 April 1995 see page 5, line 21 - page 6, line 9; claims	1-5
X	EP 0 379 256 A (COLGATE PALMOLIVE CO) 25 July 1990 see claim 1; examples	1-5
X	EP 0 536 820 A (COLGATE PALMOLIVE CO) 14 April 1993 see claims; examples	1-5
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

5 August 1998

Date of mailing of the international search report

17/08/1998

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INTERNATIONAL SEARCH REPORT

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE WPI Section Ch, Week 9035 Derwent Publications Ltd., London, GB; Class A97, AN 90-264444 XP002028442</p>	1-3,5
A	<p>& JP 02 184 609 A (SANYO CHEM IND LTD) see abstract</p> <p>-----</p> <p>DE 27 00 806 A (BAYER AG) 20 July 1978 see page 5, line 15 - line 30; claims</p> <p>-----</p>	1,9

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 98/08571

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9214810 A	03-09-1992	AT 155522 T AU 655621 B AU 9144691 A CA 2100670 A,C DE 69126892 D DE 69126892 T	15-08-1997 05-01-1995 15-09-1992 16-08-1992 21-08-1997 15-01-1998
		EP 0640122 A ES 2104888 T JP 6505036 T KR 9615974 B US 5411585 A	01-03-1995 16-10-1997 09-06-1994 25-11-1996 02-05-1995
FR 2710919 A	14-04-1995	NONE	
EP 0379256 A	25-07-1990	US 5008030 A AT 138093 T CA 2007812 A,C DE 69026967 D DE 69026967 T GR 90100022 A,B	16-04-1991 15-06-1996 17-07-1990 20-06-1996 02-01-1997 07-06-1991
EP 0536820 A	14-04-1993	CA 2077398 A GR 1001375 B	07-03-1993 29-10-1993
DE 2700806 A	20-07-1978	NONE	

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